

1614

**REMOVAL SITE EVALUATION SOLVENT
RECOVERY SYSTEM-BUILDING 12 PAINT SHOP**

06-01-1991

X/X

7

RSE

1614

REMOVAL SITE EVALUATION

SOLVENT RECOVERY SYSTEM - BUILDING 12 PAINT SHOP

Feed Materials Production Center

U.S. Department of Energy

June 1991

REMOVAL SITE EVALUATION
SOLVENT RECOVERY SYSTEM - BUILDING 12 PAINT SHOP

INTRODUCTION

The installation of a solvent recovery system has been identified by the Feed Material Production Center (FMPC) Laboratory Total Quality Team as a way to reduce the amount of hazardous waste generated at the FMPC. The system is comprised of a distillation still which will be installed in the Building 12 (Maintenance) paint shop paint booth. The still will be used to recover several different types of solvents including Aliphatic Petroleum Distillates, 1,1,1-Trichloroethane, Methyl Ethyl Ketone, Xylene, Aromatic Hydrocarbons, Ketone, Glycol Ether, and Toluene. These solvents are the typical components of the paint thinners used in the FMPC paint shop. The paint thinners are used to clean paint from painting equipment. Normally the paint thinner/paint combination is drummed and handled as hazardous waste. Recovery and reuse of the paint thinner solvents will reduce the amount of hazardous waste generated at the paint shop.

This Removal Site Evaluation (RSE) is being completed to address the environmental impacts of installing a system for minimizing hazardous waste generation at a facility which is listed on the Environmental Protection Agencies National Priorities List (NPL). The intent of this RSE is to ensure that a review of this planned action has been completed and documented in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) process.

This operation will be conducted in compliance with Resource Conservation and Recovery Act (RCRA) regulations. Operation of this system is being defined under RCRA as recycling of hazardous waste for reuse, not as treatment of hazardous waste.

The procedure for operation of the system will be written to state that waste liquid regulated as hazardous waste will not be mixed with waste liquid that is not regulated as hazardous waste. This will be done to ensure that the still bottoms generated from the distillation of RCRA waste liquid will not be mixed with still bottoms generated from the distillation of non-RCRA waste liquid.

The still is a model S-8V manufactured by Siva International, Inc. It has physical dimensions of 44" high by 48" wide by 31" deep. The still is operated by placing the waste liquid in a receiving tank and heating the liquid to the boiling point of the solvent being recovered. As the solvent boils off, it is cooled and condensed by two closed loop circulating water condensers and drained to an external container for reuse. The still bottoms left behind are collected in a disposable liner which is installed prior to adding the waste to the still. The still bottoms will be handled as RCRA hazardous waste. A permanent 240V power connection and a water connection are required to operate the still. The still is equipped with fail-safe systems including the following:

REMOVAL SITE EVALUATION
SOLVENT RECOVERY SYSTEM - BUILDING 12 PAINT SHOP

1. An internal water flow sensor that will shut down the heating unit when the cooling water flow is below 30 gallons per hour.
2. A lid interlock safety mechanism that will not allow the lid to be opened when the unit is operating, or when the temperature inside the boiler is above 130° F.

The still is being installed in the paint shop paint booth because of the explosion-proof nature of the booth, the availability of a ventilation system in the booth, and the close proximity of the paint shop hazardous waste accumulation area. It will be operated by paint shop personnel. Initially, the still will be used to recover solvents from the paint shop cleaning operations. Once the unit has proven to be effective, use will expand to the recovery of solvents generated in the FMPC laboratory.

This Removal Site Evaluation (RSE) has been completed by the DOE under authorities delegated by Executive Order 12580 under Section 104 of CERCLA and is consistent with Section 300.410 of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP). This RSE addresses the installation of a solvent recovery system distillation unit and has been completed to determine whether conditions present warrant a removal action under CERCLA.

SOURCE TERM

The only source term for this process is the air emission from the open container into which the recovered solvents are drained from the distillation unit. During operation of the distillation still, the unit is sealed by the locking lid. The temperature of the waste liquid is raised by the heating element until the temperature at which the solvent vaporizes is reached. A water cooled condenser lowers the temperature so the solvent vapor is returned to a liquid state and the liquid is drained to an external container from the unit by gravity. No emissions are generated from the unit during the heating of the waste liquid due to the seal that is produced by the locking lid. However, normal vaporization of the solvent that is in the external container will occur. This vapor will escape through the open neck of the container. This emission will be equivalent to the evaporation of solvent from an open container at room temperature.

During the operation of filling the distillation unit with the paint thinner/paint waste liquid, personnel will be required to comply with FMPC-516, Control of Permits for Accomplishing Hazardous Work and/or other SOPs as appropriate to the process.

The following types of solvents will be recovered from this operation and will be contained in various containers inside the paint shop spray booth.

REMOVAL SITE EVALUATION
SOLVENT RECOVERY SYSTEM - BUILDING 12 PAINT SHOP

1614

1. Aliphatic Petroleum Distillates
2. 1,1,1-Trichloroethane
3. Methyl Ethyl Ketone
4. Xylene
5. Aromatic Hydrocarbon
6. Ketone
7. Glycol Ether
8. Toluene

Waste residues (still bottoms) generated during the distillation of solvents which are listed or characteristic waste as defined by RCRA will be handled as hazardous waste. Waste residues (still bottoms) generated during the distillation of solvents which are not listed or shown not to exhibit the characteristic of ignitibility as defined by RCRA will be handled as non-hazardous waste.

One of the reasons for placing this system into the paint shop spray booth is contain any vaporization within this booth. The paint shop spray booth is equipped with a ventilation system which is used during painting activities. This ventilation system will also be used during operation of the distillation system so that any vapor generated from the open container of solvents is removed from the area.

EVALUATION OF THE MAGNITUDE OF THE POTENTIAL THREAT

The following is a description of the distillation unit installation and operation. This description is provided as a basis for evaluating the magnitude of potential threat from this operation.

The solvent recovery system involves installing and operating a distillation still in the FMPC paint shop spray booth (Building 12) for the recovery of solvents used to clean paint from painting equipment. This location was chosen because of the explosion-proof nature of this room, the close proximity of the paint shop hazardous waste accumulation area, and the ventilation system available within this room. However, there are no systems to eliminate the potential for spills of the paint thinner/paint waste liquid within this room. Spill control and cleanup will be the responsibility of personnel who operate the system. The method of cleaning up spills will be addressed in the procedure generated for operation of this system.

Currently, the used paint/paint thinner waste liquid is drummed in the hazardous waste accumulation area and handled as hazardous waste. Approximately 5 gallons of the used paint/paint thinner waste liquid are generated per month. The still is capable of processing 10 gallons of the used paint/paint thinner waste liquid in one 5 hour batch operation. Based on the generation rate and processing rate, the still is projected to operate approximately once every two months. The amount of solvent recovered from 10 gallons of paint/paint thinner waste liquid

REMOVAL SITE EVALUATION
SOLVENT RECOVERY SYSTEM - BUILDING 12 PAINT SHOP

placed into the still is estimated at 8 gallons. This estimate is based on the amount of solvent used to clean paint equipment in the paint shop and will vary depending on how painting equipment is cleaned. The still bottoms that remain in the unit after the 5 hour cycle is complete will be handled as hazardous waste, but will constitute a smaller volume of waste since the solvents have been removed. The still bottoms will be removed from the still inside of a teflon/fiberglass disposable liner which is installed prior to adding the hazardous waste liquid to the still. The liner and still bottoms are removed from the still and placed into a container that is designated for the storage of hazardous waste and is within the hazardous waste accumulation area in the paint shop. Once the container of hazardous waste still bottoms is full, the container will be removed from the Satellite Accumulation Area and placed into storage in an approved FMPC hazardous waste storage unit.

To complete installation, the still will require a 240V electrical connection, a water connection for resupply of cooling water that evaporates, and an external container into which will drain the recovered solvents. Installation will only involve the routing of electrical conduit and wiring, connection to an existing power source in Building 12, and routing and connection of a 1/4" water line to the 1/4" NPT inlet port on the still. Except for these items, the system is completely self-contained and requires only floor space for installation. The physical dimensions of the still are 48 inches wide, 44 inches high, and 31 inches deep with a capacity of ten gallons.

The operation of the still is based on heating of the waste liquid to boil off the solvent. The solvent is then cooled and condensed on the inside of the unit using two closed-loop water circulating condensers and drained to the external container. The cooling water is directed through a radiator and a forced air cooling system dissipates heat from the radiator and cooling water.

The system will be operated by paint shop personnel who will be appropriately trained on the equipment operation. A standard operating procedure will be written and available at the equipment location for reference. This procedure will address the placement of the hazardous waste liquid into the still and the action to be taken to respond to a spill during this operation.

A Permit to Operate from the Southwest Ohio Air Pollution Control Agency will be obtained prior to operation of the distillation unit.

No potential threat exists from the installation of this equipment.

The potential threat resulting from the operation of this equipment takes the form of air emissions from the open container of recovered solvent, the possibility of fire or explosion from accumulated solvent vapor, and the potential for spills of liquid hazardous waste (paint/paint thinner waste liquid).

REMOVAL SITE EVALUATION
SOLVENT RECOVERY SYSTEM - BUILDING 12 PAINT SHOP

A Permit to Operate will be obtained from the Southwest Ohio Air Pollution Control Agency prior to operation to establish that the distillation still is operating within the requirements for air emission sources.

To minimize the threat of fire or explosion, the still is being placed into the paint shop spray booth which is rated as a Class 1, Division 1, Group D facility. The rating meets the manufacturer's requirement. The paint shop spray booth is equipped with a ventilation system which will be used whenever the distillation system is operated to remove any solvent vapor from the area and reduce the potential for fire or explosion.

The operation of the still will occur in a manner that will minimize the potential for liquid spills. Paint/paint thinner waste liquids are generated in small amounts at any one time in the paint shop. Typically a piece of equipment will be cleaned in the bottom of a metal pail in which approximately a pint of paint thinner has been added. Once the paint equipment is clean, this paint/paint thinner waste liquid would be placed into a 55-gallon drum in a Satellite Accumulation Area. Once the still is installed, the small amount of liquid generated will be placed directly into the still receiver tank. Since only small quantities are handled at any one time, the potential for a spill is minimal. However, the response and cleanup to a spill of hazardous waste from the still will be addressed in the Standard Operating Procedure developed for the operation of this equipment. This SOP will address any type of spill from the still whether it be a spill during loading, a breach of the still system, or a spill that occurs as the still bottoms are removed. The response and cleanup will involve containing the spill with protective diking, wiping up the spill with absorbent pads, and handling all cleanup materials and waste as RCRA hazardous waste.

The potential threat from the installation and operation of this equipment will be mitigated by the following previously discussed control measures:

- Built-in containment of unit.
- Vapor containment of paint booth.
- Liquid containment of spills.
- Hazardous liquid management per SOP.

REMOVAL SITE EVALUATION
SOLVENT RECOVERY SYSTEM - BUILDING 12 PAINT SHOP

ASSESSMENT OF THE NEED FOR REMOVAL ACTION

Consistent with Section 40 CFR 300.410 of the National Contingency Plan, the Department of Energy (DOE) shall determine the appropriateness of a removal action. Eight factors to be considered in this determination are listed in 40 CFR 300.415 (b)(2). The following apply specifically to the installation of a distillation still in Building 12 for the purpose of recovering solvents.

40 CFR 300.415 (b)(2)(iii)

Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.

40 CFR 300.415 (b)(2)(vi)

Threat of fire or explosion.

APPROPRIATENESS OF A RESPONSE

If it is determined that a response action is appropriate due to the potential threat from the installation of a solvent recovery distillation still, a removal action may be required to address the existing situation.

If a planning period of less than six months exists prior to initiation of a response action, DOE will issue an Action Memorandum. The Action Memorandum will describe the selected response and provide supporting documentation for the decision.

If it is determined that there is a planning period greater than six months before a response is initiated, DOE will issue an Engineering Evaluation/Cost Analysis (EE/CA) Approval Memorandum. This memorandum is to be used to document the threat of public health and the environment and to evaluate viable alternative response actions. It will also serve as a decision document to be included in the Administration Record.

Based on the evaluation of all of the above factors, it has been determined that existing controls for the planned action are adequate and a removal action is not required.